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EXAMINER				
STIMPERT, PHIL/PEARL				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/564,584

Applicant(s)

BIESTER, KLAUS

Examiner

Philip Stimpert

Art Unit

3746

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-13, 15, 16, 33, 35-39 and 42-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-13, 15, 16, 33, 35-39 and 42-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-849)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 13 July 2009 has been entered.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the pressure relief valve of claim 33 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 33 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In particular, the examiner finds no support for "a pressure relief valve communicating with the inlet port" as claimed. Further, a word search of the applicant's specification does not yield any use of the word "relief." If the applicant believes this feature to be supported, the support therefor should be clearly pointed out in the next reply.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 16 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
7. Regarding claim 16, there are two antecedent basis errors in the claim. "The discharge pipe" lacks antecedent basis, and "an intermediate reservoir" is a second positive recitation thereof.
8. Regarding claim 33, the recitation of "the inlet port" lacks antecedent basis in claim 1. The inlet port will be interpreted as synonymous with the second port of claim 1.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 10, 11, 13, 15, 16, 33, 35, 37, 42, and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dietz et al. (US 2002/0108747) in view of Yie (US 4,862,911).
11. Regarding claim 1, Dietz et al. teach a pump device for the hydraulic actuation of a valve (see Fig. 5) used in the production of hydrocarbons (such as crude oil or natural gas). In particular, Dietz et al. teach a safety valve (60, 61, 110, see Fig. 2), and a pump (102, see paragraph 25). Dietz et al. teach that the pump can pump hydraulic fluid in the direction of the valve (to actuate the mechanical linkage 95), and that the

pump may be an electric pump (thus comprising an electric drive device). Dietz et al. do not teach the details of the pump (102), and thus do not teach a piston-cylinder unit. Yie teach a high pressure pump and a valving arrangement therefor. In particular, Yie teach a piston (45) within a cylinder (40), first (31) and second (22) ports of the cylinder. Yie teach that the piston reciprocates, traveling to a first position (as shown in Fig. 1) forcing fluid from the cylinder out the first port (31) and then traveling to a second position (as shown in Fig. 2) drawing fluid through the second port (22) into the cylinder (40). Various piston positions are also taught in Fig. 7. Yie also teaches a drive mechanism (65) for providing the reciprocation, which may be electrical (col. 7, ln. 13-14). As Dietz et al. plainly contemplate that a conventional pump may be used to provide the hydraulic fluid to their safety valve, it would be obvious to one of ordinary skill in the art to use a pump such as that taught by Yie in order to supply that pump. Thus provided, the pump of Yie would pump the hydraulic fluid of Dietz et al., and the first port (31) of Yie would direct the hydraulic fluid toward the valve under pressure, and would be effectively in fluid communication with the actuator (110) of the hydraulically actuated valve.

12. Regarding claim 10, Yie teaches the piston (45) is adjustably supported (for reciprocation) in a piston chamber (41) of the cylinder, and that the first (31) and second (22) ports are disposed on the face side of the piston chamber (41), and include (constitute) suction (22) and discharge (31) holes, the suction hole (22) opening into an intermediate reservoir (21).

13. Regarding claim 11, Yie teaches that each hole has a non-return valve (24, 32) extending through a valve member (20, 36) into a cylinder bottom plate (14), the non-return valves being subjected to a (spring) force opposite to the hydraulic fluid flow direction through the respective hole.

14. Regarding claim 13, Yie teaches that the suction hole (22) opens into the intermediate reservoir (21) with its end facing away from the piston.

15. Regarding claim 15, Yie teaches that the discharge hole (31) is connected to a discharge pipe (15). In the instant combination, the discharge pipe (15) is used to pass hydraulic fluid to the actuator (110) of the valve of Dietz et al.

16. Regarding claim 16, Yie teaches that the discharge pipe (31) is brought out through a volume in direct communication with the intermediate fluid reservoir (21), as shown in Fig. 1.

17. Regarding claim 33, the pump of Yie consists of several modules (for instance 60, 65, 14) and is thus considered to be of modular construction. Further, the discharge valve (32) of Yie functions to relieve pressure built by the pumping action, and is thus considered a pressure relief valve which communicates at least indirectly via the pump chamber with the inlet port.

18. Regarding claim 35, Dietz et al. teach a quick-release coupling (47) between a housing of the pump and a hydraulic fluid supply pipe (39).

19. Regarding claim 37, Dietz et al. teach that the hydraulic fluid is an injection fluid, in that it is injected into the hydraulic valve system by the pump.

20. Regarding claim 42, Dietz et al. teach that the injection fluid is an inhibitor, at least in that it is used to inhibit the closing of the safety valve.

21. Regarding claim 44, Dietz et al. teach an apparatus for a subsea tree used in the production of hydrocarbons, a pump (102) to pump hydraulic fluid into a conduit (77) for hydraulic actuation of a subsea tree valve (60, 61, 110), an electrical drive device (see paragraph 25) movably connected to the pump (102) to drive the pump, and an electrical cable (80) connecting the power source to the electrical drive device.

According to the combination with Yie, Yie teaches a piston cylinder unit having a piston (45) within a cylinder (40) and an electric drive (65) to drive the piston (45) and thereby pressurize hydraulic fluid in the cylinder (40) and force it to the actuator (110) of the valve.

22. Regarding claim 45, Dietz et al. teach a hydraulic source (see Fig. 24) located subsea and communicating with the pump, in particular the cylinder (40) of Yie for the hydraulic fluid pumping. The examiner notes that "a hydraulic source" is a broad limitation, and reads on any holding area of the incompressible fluid of Dietz et al.

23. Regarding claim 46, Dietz et al. teach that the pump and electrical drive device are adapted for releasable connection to the body of the subsea tree via threaded joints (47, see paragraph 14).

24. Claims 12 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dietz et al. in view of Yie and Rodgers (US 4,222,725).

25. Regarding claim 43, Dietz et al. teach a pump device (102) for the hydraulic actuation of a safety valve (60, 61, 110) on a pipeline used in the production of hydrocarbons. According to the combination with Yie, the pump device comprises a body (40) with a cylinder (41) housing a piston (45) such that hydraulic fluid can be pumped under pressure in the cylinder to the actuator (110) of the safety valve, and an electrical drive device (65) movably connected to the piston of the piston-cylinder unit to move the piston in a longitudinal direction inside the cylinder (41). Neither Dietz et al. nor Yie teach any particular pressure monitoring. Rodgers teaches an injection pump, and a system for monitoring the pressure therein. Rodgers particularly teaches a pressure sensor (56) for sensing hydraulic fluid pressure, a pressure switch (34) receiving signals from the sensor, and that the pressure switch activates a relief valve (24) upon the pressure in the cylinder reaching a predetermined value (see Fig. 3). Rodgers teaches that this system provides response to errors in the pumping process. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the pressure sensing system of Rodgers et al. to the pump of Yie as applied to the apparatus of Dietz et al. in order to provide error response to that system. Regarding claim 12, Yie teaches that the holes are formed in a cylinder bottom plate (14) releasably fixed on the cylinder (4). As taught by Rodgers, the pressure sensor (56) is connected to the cylinder. As such, any branch (i.e. 11 or 15) of Yie will be at least indirectly connected to the pressure switch taught by Rodgers.

26. Claims 2-5 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dietz et al. in view of Yie and Giese (US 1,852,560).

27. Regarding claim 2, Yie teaches providing linear movement of the piston either by a drive shaft and cam system (Fig. 7) or by fluid pressure (Fig. 8). However, neither Dietz et al. nor Yie teach a spindle drive and gear system. Giese teaches an electrical drive which includes a spindle drive (28, 29), a reduction gear (36), a spur gear (35) and a drive shaft (see Figs. 1 and 2) rotated by an electric motor (32). This spindle drive is taught for the purpose of providing linear movement of a piston. One of ordinary skill would recognize that a spindle drive as taught by Giese could be applied to the piston of Yie in the apparatus of Dietz et al. using known methods of construction of mechanical devices, and that it would produce the predictable result of linear motion of the piston. Where a claimed improvement on a device or apparatus is no more than "the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement," the claim is unpatentable under 35 U.S.C. 103(a). Ex Parte Smith, 83 USPQ.2d 1509, 1518-19 (BPAI, 2007) (citing KSR v. Teleflex, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007)). Accordingly, Applicant claims a combination that only unites old elements with no change in the respective functions of those old elements, and the combination of those elements yields predictable results; absent evidence that the modifications necessary to effect the combination of elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a). Ex Parte Smith, 83 USPQ.2d at 1518-19 (BPAI, 2007) (citing KSR, 127 S.Ct. at 1740, 82 USPQ2d at 1396.

Accordingly, since the applicant[s] have submitted no persuasive evidence that the combination of the above elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a) because it is no more than the predictable use of prior art elements according to their established functions resulting in the simple substitution of one known element for another. The examiner notes that Giese does not explicitly teach reciprocation. However, one of ordinary skill in the art would recognize that such reciprocation would be necessary between uses of the pump of Giese in its application as a mud gun.

28. Regarding claim 3, Giese teaches a rotatable, but axially immovable threaded spindle nut (28) threadedly engaging an axially movable threaded spindle (29).

29. Regarding claim 4, Giese teaches that the threaded spindle is a threaded shaft (29) releasably (see nut in Fig. 2) connected at its actuating end to the piston (17).

30. Regarding claim 5, Giese teaches that the spindle nut (28) is releasably connected to the reduction gear (36).

31. Regarding claim 47, Dietz et al. teaches a pump device for the hydraulic activation of a safety valve (60, 61, 110) on a tree used in the production of hydrocarbons, comprising, as taught by Yie, a body (40) with a cylinder (41) housing a piston (45) such that hydraulic fluid can be pumped under pressure in the cylinder to the actuator of the safety valve (110, of Dietz et al.). Further, as taught by Giese, the pump device comprises an electrical device (32) movably connected to gears (28, 29, 35, 36) for rotating an axially immovable threaded spindle nut (28) threadingly engaging an axially movable threaded spindle (29) connected to the piston of the piston-cylinder unit

to move the piston in a longitudinal direction inside the cylinder as the threaded spindle nut (28) threads onto the threaded spindle (29).

32. Claims 6 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dietz et al. in view of Yie Giese as applied to their respective parent claims above, and further in view of Flinchbaugh et al. (US 4,398,110).

33. Regarding claim 6, neither Dietz et al., Yie, nor Giese teach a harmonic drive gear. As a result, neither teaches a flexible cup-shaped toothed sleeve. Flinchbaugh et al. teach an electric actuator including a harmonic gear (see abstract), and indicate generally that harmonic gears provide a high torque to weight ratio (col. 1, ln. 51-55). Speaking generally, harmonic drive gears are well known in the art, and are known to provide an excellent gear ratio in a compact (and thus light as indicated by Flinchbaugh et al.) package. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the gear train of the pump of Giese to include a harmonic drive gear as taught by Flinchbaugh et al., in order to take advantage of the harmonic drive gear's characteristic compactness and lightness. As taught by Flinchbaugh et al., such a harmonic drive gear would include a flexible, cup-shaped toothed sleeve (32) which would be rotationally rigidly connected to the spindle nut (47) of Giese.

34. Regarding claim 39, in a combination of Dietz et al, Yie, Giese, and Flinchbaugh et al., the reduction gear is a harmonic drive gear as taught particularly by Flinchbaugh et al.

35. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dietz et al. in view of Yie, Giese and Flinchbaugh et al. as applied to claim 6 above, and further in view of Campbell et al. (US 3,261,591).

36. Regarding both claims 8 and 9, in the combination, a wave generator (62) as taught by Flinchbaugh et al. would be rotationally rigidly connected to a first spur wheel (49) of Giese, and a second spur wheel (44) would be rotationally rigidly connected to the drive shaft of the motor (50) of Giese. Neither Giese nor Flinchbaugh et al. teach that the spur gear is helically toothed. However, Campbell et al. teach a gear system for a winch, and teach "helical or double helical gear trains interposed between the prime mover and the haulage element dependent on the torque and speed of rotation," (col. 1, ln. 30-32). As a result, it is clear that one of ordinary skill would be aware of the presence of helical and double helical spur gears in the art, and that they would be provide the predictable result of transferring rotation between the drive shaft of Giese to the piston. Further, Giese, Flinchbaugh, and Campbell all provide evidence that the provision of various gears may be accomplished by methods known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a helical or double helical spur gear in the drive train of the pump of Giese as modified by Flinchbaugh et al. and used in the system of Dietz et al., as such a gear would constitute a mere substitution of one known element for another to achieve a predictable result.

37. Claims 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dietz et al. in view of Yie as applied to claim 1 above, and also in view of Giese as applied to claim 3 above respectively, and further in view of Hommel (US 6,208,923).

38. Regarding claim 36, neither Dietz et al., Yie nor Giese teach redundant servomotors. Hommel teaches a fault-tolerant steering mechanism, including a reciprocating element (1) analogous to the piston of Giese, and two servomotors (14a, 14b) arranged to actuate the reciprocating element (1) and arranged in a redundant fashion. Hommel teaches that this provides reliable control of the reciprocation, even in the event of a fault (col. 1, ln. 40-42). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use two redundantly arranged servomotors as taught by Hommel to replace the electric motor of Giese, in order to gain reliability of control.

39. Regarding claim 38, Hommel teaches a position sensor (3) detects the position of the reciprocating element, which would be the threaded spindle in the present combination.

Response to Arguments

40. Applicant's arguments filed 13 July 2009 have been fully considered but they are not persuasive.

41. With respect to the argument that Dietz et al. does not teach that the pump is in fluid communication with the safety valve, the examiner disagrees. In particular, as specified above, Dietz et al. do teach that the pump is in fluid contact with at least an

actuator (110) of the safety valve. Given the lack of specificity accorded to the safety valve by the applicant's claims, this is deemed sufficient to meet the limitations of the claims. Further, with respect to claim 44, the presence of mechanical elements in the linkage between the pump and the actual valve body of the safety valve does not appear to negate the utilization of hydraulic fluid as the primary means of selectively transmitting energy to the valve. It is thus deemed proper to consider the system disclosed by Dietz et al. as substantially hydraulically actuated.

42. With respect to the argument that Dietz et al. does not teach the intermediate reservoir of claim 16, the examiner disagrees. Again, given the lack of specificity of the term "intermediate reservoir," the volume between elements 14 and 20 of Yie appears to constitute such a reservoir, and the discharge hole and/or pipe penetrates through that volume.

43. With respect to the argument that Dietz et al. does not teach the claimed quick release coupling, the examiner notes that the recitation of "a hydraulic fluid supply pipe" is not tied to any other limitation, particularly not to supplying the hydraulic fluid used by the pump. Thus, since it is known in the art to use produced hydrocarbons such as oil as hydraulic fluids, the production line (39) of Dietz et al. constitutes a supply pipe for hydraulic fluid. The quick release coupling (47) is thus spatially located between the pump and the supply pipe, as claimed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip Stimpert whose telephone number is (571)270-1890. The examiner can normally be reached on Mon-Fri 7:30AM-4:00PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art
Unit 3746

/P. S./
Examiner, Art Unit 3746
23 October 2009